REMARKS

Reconsideration and allowance in view of the following remarks are requested. Claims 1, 3-7, and 9-31 are pending in the application. No amendments have been made to the claims. Applicants respectfully request reconsideration of the claims.

What a prior art reference teaches one of ordinary skill in the art is a question of fact. *In Re John R. Beatie*, 974 F.2d 1309, 1313 (Fed. Cir. 1992). Applicants submit herewith the Declaration of Joachim Heitbaum (the "Heitbaum Decl.") providing evidence how one skilled in the art would view the cited prior art and the claimed invention.

Claims 1, 3-7, 9, 10, 13, and 15-31 were rejected under 35 U.S.C. § 103(a) as obvious over WO 00/44061. The Examiner asserts that U.S. Patent 6,709,789 to Hambitzer et al. ("the '789 patent") is an English equivalent of WO 00/44061. Applicants respectfully traverse each of the rejections and submit that the '789 patent, taken alone or in combination with other art or the knowledge of one having ordinary skill in art, does not disclose or suggest each and every feature of any of claims 1, 3-7, 9, 10, 13, and 15-31.

With respect to claim 1, the Office Action acknowledges that the '789 patent fails to disclose a ceramic in a particulate form as the carrier for the salt particles, but then states it would have been obvious to use spherical "particles," rather than fibers, as the carrier material, absent a new or unexpected result. (November 13, 2008 Office Action at p. 3). However this configuration does yield unexpected results. Several favorable results are described at pages 4 and 5 of the present application including: 1) the invention may be integrated well and cost-effectively into the manufacturing process of a battery; 2) the safety which results from this configuration is so good that even during nail tests and temperature load tests which simulate extreme mishandling of the cell, no

safety critical increase of temperature or pressure are observed; 3) it is possible to completely enclose the negative electrode with the porous structure, thus providing the safety effect independent of the point at which a safety critical state occurs; and 4) the increased safety resulting from the claimed invention was significant. The test results displayed in the table at column 6, lines 20-32 of the '789 patent show that a small flame was observed when conducting a "nail test." In contrast, the results of a needle test, shown at page 16, lines 30-31 of the present application, indicate that no flame was observed ("nail test" and "needle test" are synonymous terms describing the same type of test). As explained in the application and by the declarant, these improved results in safety tests were not expected. (*See* Heitbaum Decl. ¶ 4 and Present Application at page 4, lines 23-25). Additionally, a detrimental increase in electrical resistance was expected in view of the narrow pores caused by this configuration, which would therefore only allow a reduced charging and discharging current. (*See* Heitbaum Decl. ¶ 4 and Present Application at page 4, lines 23-25). Experimental results, however, show that a cell according to the present application does not show the expected increase in resistance. (Present Application at page 5).

The Office Action states in response to the arguments made in the Applicants' previous reply that "[t]he reference teaches a fibrous carrier material that is in the form of a felt, fleece or fabric" and maintained "that it would be obvious to use a carrier material in particulate form, absent a showing of any criticality resulting from this shape." (November 13, 2008 Office Action at p. 6). Simply substituting the fibrous carrier materials of the '789 patent with a carrier material in particulate form, as suggested on page 7 of the November 13, 2008 Office Action, would not result in a solid volume proportion as high as 40%. (*See* Heitbaum Decl. ¶ 5). Special techniques such as mechanical concussion, approximating particles with a spherical shape, or using two

solid particle sizes would need to be utilized. (*See* Heitbaum Decl. ¶ 5 and p. 8 of the present application). The '789 patent makes no mention of any such techniques. (*See* Heitbaum Decl. ¶ 6).

The Office Action further states that the disclosure in the '789 patent that "the layer material is made by coating a porous carrier material 18 with the salt 10 in such a manner that its pores 19 are not completely closed" suggests that the porous structure of the '789 patent has a relatively low porosity and conversely a relatively high volume fraction of material. (November 13, 2008 Office Action at p. 6). The Office Action alleges that this discussion indicates that narrow pores are part of the structure. (November 13, 2008 Office Action at p. 6). This interpretation, however, is contrary to the way in which the invention of the '789 patent functions.

As was explained in the response to the March 19, 2008 Office Action, the safety features which result from the invention embodied by the '789 patent result from the chemical properties of the salt, and not the physical nature of the microporous structure. The '789 patent teaches two ways of incorporating salt into the cell:

1) A particulate structure consisting of salt particles which may be a loose filling of salt grains or may be a sold body formed by binding of salt particles or by sintering of salt grains (as shown in Fig. 2 and col. 4, lines 13-32 of the '789 patent);

2) Coating of the salt onto a porous carrier material, which can either be rigid (e.g., made from glass or oxide ceramics) or a flexible fiber compound structure (e.g., in the form of felt fleece or fabric)(as shown in Fig. 3 and col. 4, lines 33 to 60 of the '789 patent).

In either embodiment, in order to achieve the safety benefits of the '789 patent, the pores have to be of sufficient size so that a discharge of active mass, which grows at the

electrode during charge or discharge of the cell comes into contact with a sufficient surface area of salt particles, when penetrating into the porous structure. (Col. 3, lines 15-30 of the '789 patent).

The first embodiment refers to a particulate structure, but the particles are specifically made from salt, which is contrary to the non-ionically dissociating material required by claim 1. Solid volume proportions as high as 40% as required by claim 1 would normally not be achieved by these salt particles given their crystalline structure. The second embodiment states that rigid as well as elastic materials can be used. In any case the material must contain a sufficient quantity of salt per unit volume. (*See*, Fig. 3 and col. 5, lines 43-54 of the '789 patent). This requires that the total solid matter volume of inert material must not be too large in order to allow for sufficient room for the required amount of salt. This is why the '789 patent specifically teaches only compound structures, such as a rigid carrier body or a felt fleece fabric, with respect to the second embodiment. Again, solid volume proportions as high as 40% as required by claim 1 would normally not be achieved by a carrier material such as felt, fleece, or fabric. Furthermore, had it been obvious to use an inert particulate structure, then it would have been disclosed in the '789 patent given that a non-inert particulate structure is disclosed in the first embodiment. For these reasons, Applicants respectfully submit that it would not have been obvious to a person having ordinary skill at the time of the invention to use an inert carrier in particulate form in combination with the '789 patent.

Additionally, the Office Action wrongly concludes that the portion of the '789 patent stating "the layer material is made by coating a porous carrier material 18 with the salt 10 in such a manner that its pores 19 are not completely closed" (Col. 4, lines 35 of the '789 patent) suggests that the porous structure has "relatively low porosity, and conversely a relatively high volume fraction of matter." (November 13, 2008 Office

Action at pp. 6-7). This conclusion seems to imply that the phrase "to close the pores" means that the pores are completely filled. However, one of ordinary skill in the art would understand this to mean that in the coating process, a situation should be avoided in which the channels between the pores are closed such that the connections between the pores are interrupted. This is supported by column 5, lines 6-11 of the '789 patent which states "care should be taken by appropriate constructive measures that the porous structure 11 is fixed to the electrode 4 in such a manner that an active mass generated at the electrode surface penetrates into the pores without displacing the salt as a whole." In other words, the fact that care needs to be taken when coating the porous carrier material with salt such that pores are not completely closed suggests that the pore size should be larger to avoid the potential for disrupting the channels between pores.

Furthermore, even if the phrase "to close the pores" was assumed to mean that the pores are not completely filled, if one wanted to avoid filling the pores when coating the carrier material, then a larger pore size (i.e., smaller solid matter proportion) would be advantageous. In fact, the '789 patent notes that in the embodiment in which the porous structure is made of salt particles, experimental evidence suggests that the safety-increasing effect improves up to a limit with decreasing grain size, but once this limit is reached, decreasing the size of the grains making up the porous structure (i.e., decreasing the pore size) actually degrades the safety effect. (Col. 4, lines 61-65 of the '789 patent). In order to avoid this problem, "the structure in which the salt is contained, should not have too small pores." (Col. 5, lines 4-6 of the '789 patent). In other words, the '789 patent actually teaches away from having narrow pores as required by the present claims because this can actually reduce the safety-increasing effects. For these additional reasons, Applicants respectfully submit that the '789 patent does not disclose and it would not have been obvious to a person having ordinary skill at the time of the invention

to have a volume proportion of solid ionically dissociating particles of at least 40%.

Claims 3-7, 9, 10, 13, and 15-31 depend from claim 1 which, as explained above, is believed to be allowable. Thus claims 3-7, 9, 10, 13, and 15-31 are believed to be allowable as depending from an allowable base claim. Accordingly, Applicants request that the rejection be withdrawn

Claims 11 and 12 were rejected under 35 U.S.C. § 103(a) as obvious over WO 00/44061 in view of U.S. Patent Application Publication 2002/0102456 to Aihara et al. Claims 11 and 12 depend from claim 1 which, as explained above, recites subject matter that is not disclosed by WO 00/44061 (English equivalent is the '789 patent). Aihara et al. fails to remedy the above-described deficiencies in WO 00/44061. Thus, the combination of WO 00/44061 in view of Aihara et al. fails to disclose or suggest each and every element of claims 11 and 12, and the rejection of those claims is improper. Accordingly, Applicants respectfully request that these rejections be withdrawn.

The Office Action maintained the same rejections of claims 11 and 12 but did not address the arguments made in the prior response. Applicants continue to believe that the combination of the '789 patent and Aihara at al. fails to disclose or suggest all of the features and limitations of claims 11 and 12. These arguments are reiterated here for the Examiner's convenience. Aihara et al. describes the use of inorganic filler/particles together with a polymer for forming a solid layer between an electrode and a separator. The filler makes the layer porous whereby it can be penetrated by an electrolyte and thus become ionically conducting. In the example given in Aihara et al., the negative electrode is always a Li-intercalation electrode. There is no description of any storing of lithium metal inside the pores of inorganic solid particles. There are also no aspects relating to safety described in Aihara et al. For these additional and independent reasons, claims 11 and 12 are believed to be allowable over the combination of WO 00/44061 and

Aihara et al. Accordingly, Applicants respectfully request that these rejections be withdrawn.

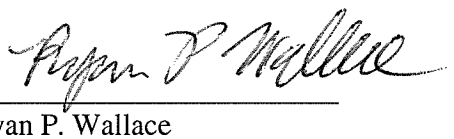
Claims 1, 3-7, 9-13 and 15-31 were also rejected on the ground of nonstatutory obviousness-type double patenting over claims 1-15 of U.S. Patent No. 6,709,789. As discussed above, independent claim 1 is believed patentably distinct from the '789 patent. Thus, Applicants respectfully request that the nonstatutory obviousness-type double patenting rejections of claim 1 and claims 3-7, 9-13 and 15-31, which depend from claim 1, be withdrawn.

CONCLUSION

In view of the foregoing remarks and the declaratory evidence submitted herewith, which should be given substantial weight, Applicants submit that the rejection of each of claims 1, 3-7, and 9-31 is improper because the cited prior art fails to disclose or suggest each and every element of the claims. Reconsideration and allowance are requested. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

In the event that this paper is not timely filed, the Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account No. 02-2135.

Respectfully submitted,

By: 

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